NYSE
AN ICE EXCHANGE

Market Maker Direct Specification for Options

NYSE Arca Options

NYSE American Options

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1 Overview

Market Maker Direct is a message-based interface that allows users to make markets on NYSE Arca's Options Exchange System (OX) in assigned series through quote messaging. OX supports two classes of market maker: lead market maker and regular market maker. All market makers are allowed to submit both quotes and orders to OX for option series in their assigned underlying equities (underlyings).

This document is for qualified market makers (MM) associated with firms that hold NYSE Arca[sm] Options Trading Permit(s) and developers that wish to write applications that can interface with Market Maker Direct (OX MM API).

Market Maker Direct uses fixed length messages and variable length bulk messages over the TCP IP protocol with binary numeric and fixed length ASCII fields. Binary values are in network Endian (Big Endian).

The message set includes two categories:

- Session management messages (Logon, Heartbeat, Test Request)
- Application messages relating to making markets

NYSE Arca API Certification

Certification testing is required and can be arranged through our Firm Testing Group (firmtesting@nyse.com). The Certification Environment is available from 3:30am-8:00pm EST, Monday through Friday, with support from 9:00am-5:00pm. Before a subscriber can go live, it is mandatory to complete approved test scripts to become certified for Market Maker Direct.

System Architecture

Interaction between market maker firms ("client" in this document) and the OX platform ("server" in this document) consists of three required interfaces:

1. The OX MM API allows quoting on OX, receipt of execution reports against those quotes, and receipt of market-maker-only administrative messages (described in this document).
2. Order flow for Options and/or Equities is supported using either ArcaDirect or the FIX protocol. Specifications for ArcaDirect and FIX can be obtained from http://www.nyse.com or from the FIX hotline (see NYSE Arca API Certification).
3. Data feeds for top of book, depth of book and general audience administrative messages, such as trading halts for options and/or equities, are available using the ArcaBook® for Options interface (not described in this document).

Each client sends messages to their assigned IP and Port. OX routes the messages to the appropriate trading system.

OX also supports Drop Copy duplicate execution reports to interested parties assigned by market maker firms.

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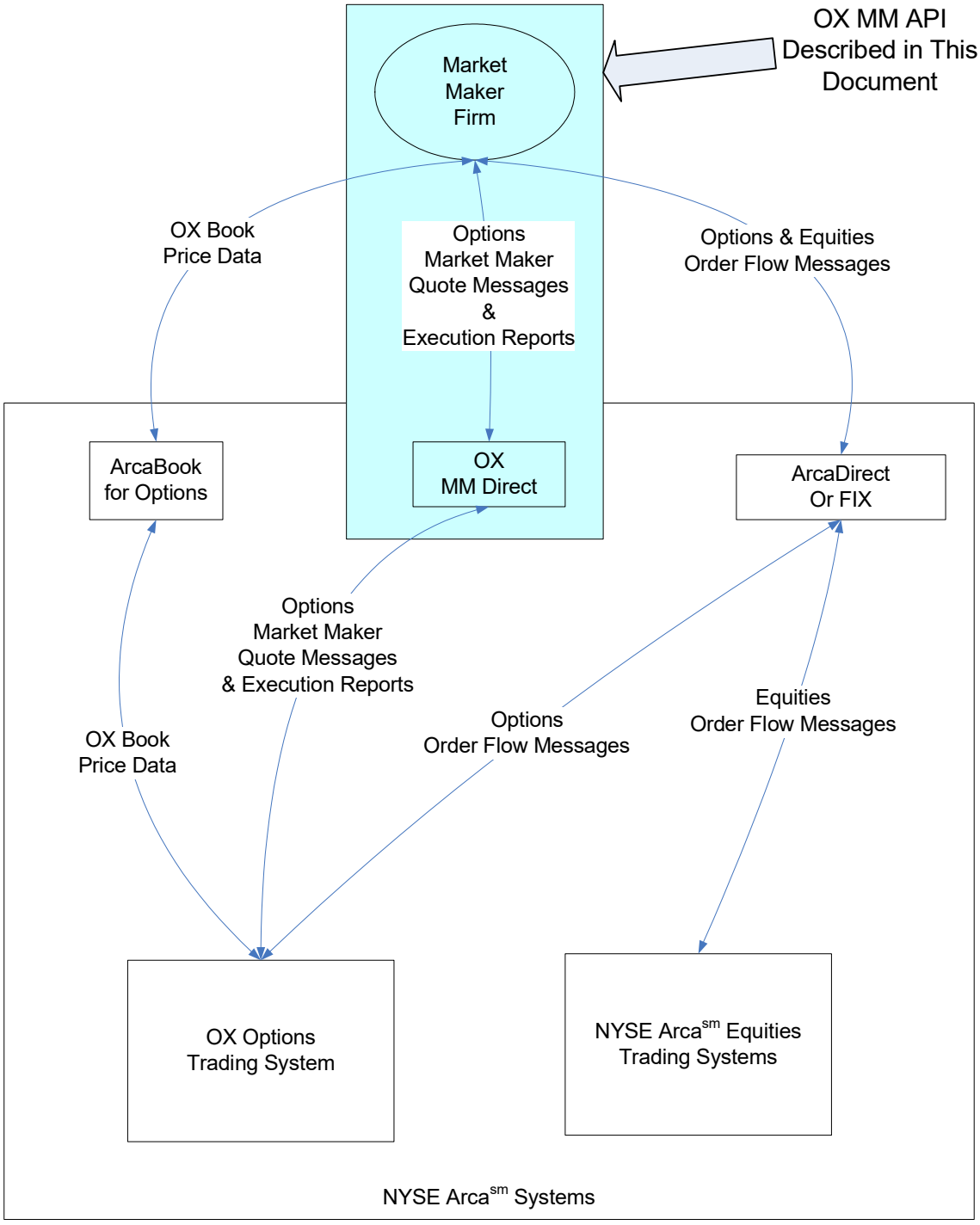
The following diagram illustrates how market makers interact with OX:



Overview of Market Maker Interfaces to NYSE Arca℠

as of 5-05-06

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2 OX Overview

Market Maker Quoting

Market makers are required to provide a valid, legal width, two-sided market in their assigned series in support of all OX auctions. Market makers are also required to maintain continuous quotes in these series to the extent required by NYSE Arca options trading rules throughout the core trading session. Quote updates are entered as Bulk Quote message into OX. A Bulk Quote message consists of several individual quotes that belong to one or more series of an underlying group. An underlying group refers to a set of series belonging to the same underlying that are allowed to pack their quotes into a single bulk quote. Each underlying group is defined in the OX system with a unique numeric id. The mapping of the seriesID to the corresponding UnderlyingGroupID can be downloaded by the MM clients via the series update message defined in the OX MM API. Quote updates for a series replace the previous quote for the specified side of the market.

Internal Locks or Crosses

Quotes trade immediately with orders or other quotes in OX when executions are possible. OX will **not** prevent market maker quotes from trading with orders or other market maker quotes.

Discretion of Quote Sizes

When trades occur against quotes, OX reduces the size of the quotes involved in the trade. It is the market maker's responsibility to recognize when the quoted size at a price has been depleted and must be re-quoted.

Hours of Operation

Hours of Operation for the NYSE Arca and NYSE American Options Exchanges (all times Eastern):

Start of Pre-Open Period – 5:30 AM

Opening Auction – 9:30 AM

Core Trading Session (Equity Options) – 9:30 AM – 4:00 PM

Core Trading Session (ETF Options) – 9:30 AM – 4:15 PM

Hours of Operation are subject to change. Please visit http://www.nyse.com for the most up to date information.

Auctions

OX offers opening and halt auctions for options trading. The Opening Auction occurs after 9:30 AM EST once the first NBBO is received in the related underlying security.

Market makers are required to have a valid, legal width, two-sided quote in their assigned series prior to each auction. These quotes must be entered with the OX MM API and are used to create the opening BBO.

Market makers may also enter orders in their assigned series during pre-open for participation in the opening auction. Market maker orders can be entered either through the ArcaDirect or NYSE Arca FIX APIs.

OX matches crossed quotes and orders on/or within the first disseminated NBBO of a series at the price where the most trade activity will occur.

Market Maker ID

The OCC market maker acronym is used as the market maker identifier on quotes. The client must send this ID on **all** quotes. The max length of the MMID is 4.

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Symbol Management

To ensure high throughput and low latency, series for MM quoting are identified using an Index Series Lookup Table. This is an ordered list from 1 to N of all series that OX will be trading this day. A new table is generated every day and disseminated at the start of the day using this API. Intra-day additions of new series are also sent to market makers using this API. Quotes should contain only the series index and not the full signature of the series.

This Index Table can be requested in two ways.

- **Logon Message.** When they log in, clients send a zero (0) in the Last Series Index Number field of the OX Logon Message. Upon receipt, OX sends the entire Index Series Lookup Table in Series Update messages. Clients should save the last index number they have received for this table. This value should be used in any subsequent Logon Messages or Series Request Messages to ensure OX sends only update messages.
- **Series Request Message.** Clients use this message to request any intra-day series additions. This message also uses the last index number mechanism to determine which updates OX should send.

Option symbols are identified for a series index using either the:

- OCC symbol, strike price, expiration date and call/put indicator.
- OPRA symbol.

Risk Mitigation

Activity-based Circuit Breakers

OX has the ability to protect firms actively quoting from excessive executions due to unusually rapid trading activity. OX can immediately pull a market maker's quotes from the market after certain user-defined thresholds of trade activity are reached.

Risk mitigation is accomplished by tracking the number of trades executed in 100 milliseconds for all series associated with one underlying assigned to a market maker. The transaction threshold default setting and min/max range is determined by the Exchange, and any changes in these parameters will be announced by Trader Update.

Within this range, MM firms can change assigned thresholds intra-day using the OX MM API.

For example:

OTP market maker: ABC:

SPY Underlying Threshold = 100 executions per 100 milliseconds

IBM Underlying Threshold = 10 executions per 100 milliseconds

Threshold checking occurs during auctions as well as core trading sessions.

When risk mitigation is invoked, the firm receives a Risk Mitigation Alert message indicating that the alarm was triggered and they are out of all quotes in the indicated underlying (e.g. IBM). In order to enter the market again, the MM must re-submit a Risk Mitigation Request message for each underlying in which an alarm was triggered.

Market Maker Explicit Quote Withdrawal

Market makers can send a Quote Takedown Request message to pull quotes by series, by underlying, or globally.

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Quotes Withdrawn on Session Disconnect

When a client session disconnects (explicitly or inadvertently), a market maker's quotes are cancelled globally. See the "Disconnects" section for more information.

Self Trade Prevention

Self Trade Prevention (STP) is available for Market Maker Quotes and Single Leg orders entered with a capacity of Market Maker on NYSE Arca and NYSE American Options. A quote/order that would execute at a price level locking a contra-side quote/order entered with the same OTPID/ATPID (or MMID linked to the same OTPID/ATPID) will be cancelled with reason text "Self Trade Prevention".

Available STP Types consist of Cancel Old, Cancel New, and Cancel Both, and are applied to quotes and orders as follows:

- **Market Maker Quotes** – the Exchange defaults all Market Maker Quotes with STP Type Cancel Old. To change the default STP Type configuration per Underlying Symbol for a given MMID, the Self Trade Prevention Request may be used. Once accepted, the requested STP Type will be applied to all quotes entered for that symbol by that MMID, on a go-forward basis. STP configurations are persisted overnight.
- **Market Maker Orders** – Self Trade Prevention is available for Single Leg orders entered using the NYSE Arca UGW Binary Gateway or CGW FIX Gateway, with a capacity of Market Maker (CustomerOrFirm = 3). STP Type is specified on an order-by-order basis using the field/tag NoSelfTrade (in FIX, tag 7928). To opt out of STP, the firm should null pad the field (Binary) or omit the tag from the order (FIX).

  The Exchange defaults PNP orders only with STP Type Cancel Old. To change the STP Type, the firm should send the order with the desired value in the field/tag NoSelfTrade (in FIX, tag 7928). An option to opt-out of STP is not available for PNP orders.

STP Type cannot be changed on a Cancel/Replace Request. The new order inherits the STP Type of the order it is replacing.

Below are the instances where Self Trade Prevention for Options will not apply:

- Self Trade Prevention will not apply if a CMTA is defined in the ClearingAccount Field on either the old or the new order.
- Self Trade Prevention will not apply for any tracking order types, cross orders, or Complex orders
- Self Trade Prevention will not apply to Auction Trading

Binary Fields

All multiple byte binary fields are signed network Endian (Big Endian) values. One byte numeric fields are unsigned.

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Binary Prices

Prices are represented as whole integers in signed binary. Market maker inbound quote prices are fixed at two decimal places. Executions of quotes may have more than two decimal places.

For prices where the decimal places are not fixed, the decimal position can be determined by using the Price Scale code, which is supplied in some messages. The Price Scale code is a character.

To determine the decimal price, divide the whole integer price by the value that the price scale code represents. For example, the: whole integer price is 1350 and the price scale code is 2. The decimal price is 1350 ÷ 100 (10^2) = 13.50.

Table 1 Price Scale Codes

Price Scale Code	Denominator Value	Denominator Value (factor of 10)
"0"	N/A	N/A
"1"	10	10^1 (10^1)
"2"	100	10^2 (10^2)
"3"	1,000	10^3 (10^3)
"4"	10,000	10^4 (10^4)

Note: a Price Scale code of **"0"** indicates that the whole integer price in the price field is the actual price and no conversion or division is necessary.

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3 Session Management Messages

Overview

A market maker firm initiates a TCP/IP session to the OX MM API Server. Session logon is always initiated by the client connection. Application messages may be exchanged between the client and server after logon is successful.

Messages have a defined number of fixed-length fields, containing both binary and ASCII data. All binary data is sent in network Endian format (Big Endian). Multiple byte binary fields are signed. Single byte binary fields are unsigned.

During periods of inactivity, the server and/or client use the Test Request and Heartbeat messages to ensure the connection is up and functioning properly. The client must be able to respond to Test Request messages from the server by sending a Heartbeat message.

Disconnects

All quotes associated with a client session are automatically pulled from the market when any type of TCP/IP disconnect occurs. A Quote Takedown Ack message is **NOT** sent to the market maker when a disconnect pulls their quotes. Maker makers must send a Risk Mitigation Request to re-enable quoting in an underlying before sending new quotes. OX sends a Risk Mitigation Ack message to indicate that quotes can now be accepted.

This feature is intended to help MM firms in emergency situations. However, firms must not rely upon this automatic cancellation as a normal business practice or to prevent liability of execution. Nor is it a substitute for working with the OX Trade Desk to verify that all quotes are indeed cancelled and that all trades have been properly reported.

To help prevent lost execution messages after a disconnection, execution messages from OX are assigned a message sequence number. When clients connect to OX, the client sends the sequence number of the last execution message processed as part of the Logon message. OX will replay any execution messages the client may have missed.

Client messages and acknowledgements from OX do not use sequence numbers. These messages are not designed to be recovered after a disconnection.

Logon Message

Clients use the Logon message to establish a connection and to identify the last execution message they have processed. The server may accept or reject the client logon. If logon is successful, OX sends a Logon message back to the client. If logon is unsuccessful, OX returns a Logon Reject message.

When the server sends the Logon message back to the client after a successful logon, the “Last Series Index Number Processed” field is filled in with the largest series index number that the server will be sending to a client. The client can use this number as one way to determine when the main series update is complete. However, if a series is loaded intra-day, the client may receive a series index number that is higher than the number given in the logon message.

For the initial connection, clients should set the Last Sequence Number field to zero. A client can also pass ‘-1’ to notify the server not to validate the sequence number. The server will accept the next sequence from the client and then send what it thinks is the next outbound sequence.

Currently, all messages sent by the client to the server are un-recoverable. Clients need not validate the Last Sequence Number field in Logon messages from the server. This field may be used in future releases to allow client messages to be recovered.

If the series index received is lower or higher than the valid range for the day with the exception of ‘0’ and ‘-1’, the message will be rejected.

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Logon Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'L'
Filler	1	Not used	
Message Length	2	Binary	The length of the message
Last Sequence Number Processed	4	Binary	Sequence number of the last response message processed. 0 – Replay everything -1 – Skip validation of this field N – replay from n + 1
Last Series Index Number Processed	4	Binary	Last Series Index number the client processed 0 – Send the whole Index Table -1 – Turn off Series Updates. N – Sends all Series of n+1 or greater
Version	2	Binary	The version of MM Direct used in this session: 1 = MM Direct version 1.8 2 = MM Direct version 1.10 3 = MM Direct version 1.13
User Name	5	Alpha/Numeric	Session ID assigned by NYSE Arca
Padding	1		
Total	20		

Logon Reject Message

The server sends a Logon Reject message only when logon validation fails. If logon was successful, the server sends a Logon message back to the client.

The Client Logon Status field indicates the reason (see the "Rejection Code Appendix"). The server will close the connection after sending the Logon Reject message. There are times when the client may not receive a response.

Logon Reject Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'l' (lower case L)
Filler	1	Not used	
Message Length	2	Binary	Length of the message
Last Sequence Number Server Received	4	Binary	Reserved for future use
Last Sequence Number Server Sent	4	Binary	Last execution message sequence number the server transmitted. -1 = unknown. This number could not be determined.
Last Series Index Number Server Sent	4	Binary	The last Series Index number sent. -1 = unknown. This number could not be determined.

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Logon Reject Message	Len	Type	Notes and Values
Client Logon Status	2	Binary	The rejection reason. See the "Rejection Code Appendix"
Text	40		
Pad	2		
Total	60		

Test Request Message

This message is sent by either side of the connection to request the other side to respond with a Heartbeat message, when that side does not receive a message during periods of inactivity. If the other side does not respond to a Test Request message, the application should assume an abnormal situation and terminate the TCP/IP connection.

The server sends a Test Request message only during periods of inactivity after the first heartbeat period (5 seconds). At a minimum, the client must respond to this message with a Heartbeat message. The server will disconnect the client following a subsequent period with no activity.

Test Request Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'1'
Filler	1	Not Used	
Message Length	2	Binary	The message length
Total	4		

Heartbeat Message

The Heartbeat message is used to respond to Test Request messages. It lets the other side know the connection is still good during periods of inactivity. The server heartbeat interval is 5 seconds.

At a minimum a client must be able to receive Test Request messages and respond with Heartbeat messages. During periods of activity the server will not send Test Request or Heartbeat messages and there is no need for the client to send them.

Heartbeat Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'0'
Filler	1	Not Used	
Message Length	2	Binary	The message length
Total	4		

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Series Request Message

A market maker can use this message to request the full Index Series Lookup Table with a zero '0' value in the Last index Number field. This can also be used after a reconnection to get updates that might have been missed during disconnects by sending the last index number that the client received. (See also the "Logon Message".) Passing a negative one (-1) in the Last Index Number field causes the server to stop sending series updates.

A unique set of series ID will be provided for each day of the calendar month. The first day of the month will have a series ID range of 10,000,001 to 20,000,000.

The series ID range will be incremented by 10 million for each succeeding day of the month.

If the series index received is lower or higher than the valid range for the day with the exception of '0' and '-1', the message will be rejected; the reject code will be - **'10' – Invalid Series.**

Series Request Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'S'
Filler	1		Pad
Message Length	2	Binary	The length of the message
Last Series Index Number Processed	4	Binary	Last series index number the client has processed: 0 – send the full Index Series Lookup Table -1 – stop sending series updates N – send all series of n+1 or greater
Total	8		

Series Update Message

This message informs the market maker of a new or existing series that can trade on the OX platform. If a client requests the full Index Series Lookup Table (see the "Logon Message" and "Series Request Message"), each series in the table is sent in a Series Update message.

The server will indicate the series update process is complete by sending a message with the Series Index Number set to (-1). Clients may receive new, unsolicited updates if OX adds a new series intra-day.

Clients may receive new, unsolicited updates if OX adds new series intra-day.

Series Update Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	's'
Filler	1		Pad
Length	2	Binary	Message Length
Series Index Number	4	Binary	Identifying number for this series. There is a special case when this is set to "-1" indicating that the server has no more Series Update Messages to send at this time.
Underlying Quantity	4	Binary	Null (reserved for explicit symbology).

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Series Update Message	Len	Type	Notes and Values
			The number of shares per option contract for this series
Status	1	Binary	Reserved for future use.
Corporate Action	1	Binary	Null (Currently Not Used). Whether the series has been created because of corporate changes in the underlying stock. 0 = No corporate changes 1 = Created for a corporate action
Underlying Symbol	8	ASCII	The underlying stock symbol for this series.
Expiration Date	8	ASCII	In YYYYMMDD format.
Put or Call	1	ASCII	0 = Put 1 = Call
Strike Price	10	ASCII	Strike price for this series.
OCC Root	6	ASCII	The OCC root symbol for the option issue this series belongs to.
OPRA Symbol	8	ASCII	The full OPRA symbol for this series.
Underlying Group	4	Binary	Underlying GroupID that the series belongs to. Always a Non zero and positive integer.
Padding	1		
Total	60		

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4 Application Messages

This section describes the API Application messages. Some general points to keep in mind:

- Binary data is in signed network Endian format (Big Endian). Single byte fields are unsigned.
- All Filler and Padding fields will contain null characters.
- ASCII fields should be left justified and null padded.

Bulk Quote Message with Sending Time (For CAT Compliance)

This message sends a set of up to 300 quotes to OX. Quotes in a Bulk Quote message must be for the same underlying group. If the entire underlying is assigned to a single group, then all the quotes for one underlying can be packed into one bulk quote. If there is more than one group for an underlying, then the bulk quote message will only allow quotes for a single group in the message.

If the client did send a bulk quote with series belonging to multiple underlying groups, OX will pick the GroupID of the first quote as valid GroupID for the bulk quote message. Any individual quote sent with different UnderlyingGroup will be rejected with "Invalid UnderlyingGroup" (Refer the appendix for the error codes)

Each quote in this message represents one side of the two-sided market. Quote updates for a series replace the previous quote on the specified side of the market. Quote prices are fixed at a scale of 2 and not variable.

Market maker bulk quote messages must be sent with the sending time in order to be CAT compliant. The Sending Time represents the time at which the Market Maker system sent the bulk quote to the exchange.

Bulk Quote Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'Q'
Filler	1	Not Used	
Message Length	2	Binary	Length of this message
Sending Time	8	Binary	Nanoseconds since Epoch, must be greater than 0.
Bulk Quote ID	4	Binary	A client-assigned ID for this bulk quote message. This ID combined with the series index and side is a unique mapping for individual one-sided quotes.
Number Quote Messages	2	Binary	Count of quotes
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Pad	10		
From 1 to 300 one sided quotes, each consisting of the following fields:			
Series Index	4	Binary	Series Index
Price	4	Binary	Price scale fixed at 2
Volume	2	Binary	0 to 32,767
Side	1	Alpha/Numeric	"1" = Bid "2" = Ask
Quote Type	1	Alpha/Numeric	Null padded = regular Market Maker Quote L = Market Maker Light Only Quote

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Bulk Quote Message	Len	Type	Notes and Values
			S = Re-pricing Quote A = Add Liquidity Only (ALO) Re-pricing Quote (NYSE Arca Options - core trading only)
End of one-sided quote fields			

Bulk Quote Acknowledgement Message

This message acknowledges a Bulk Quote Message with Sending Time (Msg Type = 'Q'). This message can contain rejection codes for any one-side quotes that failed OX validation. All other one-sided quotes were successfully processed.

Bulk Quote Ack Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'A'
Filler	1	Not Used	
Message Length	2	Binary	The length of this message
Bulk Quote Id	4	Binary	Client-assigned ID for the Bulk Quote being acknowledged.
Nack Count	2	Binary	Number of negative acknowledgements. Ranges from 0 to 300
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Pad	2		
From 0 to 300 quote rejections, each consisting of the following fields:			
Series Index	4	Binary	Series Index
Reject	2	Binary	Rejection reason code. See the Rejection Code Appendix.
Side	1	Alpha/Numeric	"1" = Bid "2" = Ask
Pad	1		
End of quote rejection fields			

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Bulk Quote Rejection Message

This message rejects an entire Bulk Quote Message with Send Time (Msg Type = 'Q') and all the one-sided quotes included on either message.

Bulk Quote Ack Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'N'
Filler	1	Not Used	
Message Length	2	Binary	The length of this message
Bulk Quote Id	4	Binary	Client-assigned ID for the Bulk Quote being rejected.
Rejection Code	2	Binary	The rejection reason. See the "Rejection Code Appendix"
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Pad	2		
Total	16		

Display Price Update Acknowledgement - for Re-pricing Quotes

This message is sent unsolicited by the Exchange to notify market makers of a display price update event for a Re-pricing Quote (NYSE Arca & American Options) or Re-pricing Add Liquidity Only Quote (NYSE Arca Options). If on arrival, such quote is assigned a display price different from its limit price, a Display Price Update Ack will be sent to the session that entered the quote each time the display price of the resting quote is updated.

The Ack will indicate the updated display price and display quantity of the quote.

Display Price Update Ack Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'J'
Filler	1	Not Used	
Message Length	2	Binary	The length of this message
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Series Index	4	Binary	Series Index
Price	4	Binary	New display price of the Re-pricing Quote or Re-pricing ALO Quote. Price scale fixed at 2
Volume	2	Binary	New display quantity of the Re-pricing Quote or Re-pricing ALO Quote. 0 to 32,767
Side	1	Alpha/Numeric	"1" = Bid "2" = Ask
Pad	5		

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Display Price Update Ack Message	Len	Type	Notes and Values
Total	24		

Quote Takedown Request Message with Sending Time (For CAT Compliance)

This message removes quotes from OX. A message can remove all quotes for one series, all series or all groups for an underlying symbol, or all quotes for a market maker.

Once a request is received, all underlying affected by the request will be flagged as out of the market and all quotes after the processing will be rejected until a Risk mitigation request is sent to be placed back into the market.

OX guarantees consistent processing of takedown requests across all the groups. This means that even though more than one ack can be generated, the result of the processing will always remain consistent across groups. There will never be a case where a success ack is sent out for 1 group and a reject ack for another.

Market Maker Quote Takedown messages must be sent with the sending time in order to be CAT compliant. The Sending Time represents the time at which the Market Maker system sent the takedown request to the exchange.

Quote Takedown Request Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'U'
Filler	1	Not Used	
Message Length	2	Binary	Message length
Sending Time	8	Binary	Nanoseconds since Epoch, must be greater than 0.
Series Index	4	Binary	Series to remove quotes from. This is Ignored if Symbol is non NULL ('\0') 0 – Entire Market N – specific series index number
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Underlying Symbol	8	Alpha	If non-NULL then clear all series for the underlying.
Underlying Group	4	Binary	If non-NULL then clear all series for the underlying group & Underlying Symbol **MUST** be populated
Pad	8		
Total	40		

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Quote Takedown Ack Message

This message acknowledges all Quote Takedown requests. Market Makers may receive unsolicited takedown acks when they are disconnected or disabled from trading due to an Exchange system problem.

An unsolicited takedown ack will also be sent when a Market Maker Quote (either regular or Market Maker Light Only Quote) partially executes on arrival, and is then cancelled to avoid locking/crossing an away market quote. In this case, both the Bid and Offer quotes are cancelled for the affected series.

Market Makers may receive an Ack for every underlying that they have quotes for in OX from one Quote Takedown Request.

Quote Takedown Ack Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	't'
Filler	1	Not Used	
Message Length	2	Binary	Message Length
Series Index	4	Binary	The series that quotes were removed from. If the series index is populated, then the takedown is at the series level 0 – Entire Market N – the specific series that had quotes removed
Rejection Code	2	Binary	The rejection reason. See the "Rejection Code Appendix"
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Underlying Symbol	8	Alpha	Contains Underlying Symbol of processed Takedown
Underlying Group	4	Binary	Contains Underlying Group of processed Takedown
Side	1	Alpha	
Pad	1		
Total	28		

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Risk Mitigation Request Message

Clients use this message to change the Risk Mitigation parameter(s) or to re-enable an underlying and make it eligible to receive new quotes after any of these events:

- An alert threshold has been triggered
- A user has requested quotes be pulled with a Quote Takedown Request Message
- Quotes are pulled for a client session disconnect.
- OX guarantees consistent processing of takedown requests across all the groups. This means that even though more than one ack can be generated, the result of the processing will always remain consistent across groups. There will never be a case where a success ack is sent out for 1 group and a reject ack for another.

Risk Mitigation Request Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'X'
Filler	1	Not Used	
Message Length	2	Binary	Message Length
Risk Limit	2	Binary	**Transaction Based** – Number of executions allowed within 100 milliseconds for this underlying. **Volume Based** – Number of contracts allowed within 100 milliseconds for this underlying. **Percentage Based** – Number of contract executed in 100 milliseconds for this underlying against total quote size on a percentage basis.
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Underlying Symbol	8	Alpha	
Action	1	Binary	0=Update Number of Trades only 1=Update Number of Trades and place Market Maker ID back into the market.
Risk Mitigation Type	1	Alpha	Possible Values: P – Percentage of Quote Based V – Volume Based T – Transaction Count Based
Total	20		

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Risk Mitigation Ack Message

This message acknowledges processing for a Risk Mitigation Request and signals that market makers can begin sending quotes again. The message simply echoes the original Risk Mitigation Request.

Risk Mitigation Ack Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'x'
Filler	1	Not Used	
Message Length	2	Binary	Message Length
Risk Limit	2	Binary	The number of executions allowed within 100 milliseconds for this underlying.
Rejection Code	2	Binary	The rejection reason. See the "Rejection Code Appendix"
Market Maker ID	4	Alpha/Numeric	OCC clearing account mnemonic.
Underlying Symbol	8	Alpha	
Underlying Group	4	Binary	
Action	1	Binary	0=Update Number of Trades only 1=Update Number of Trades and place Market Maker ID back into the market.
Risk Mitigation Type	1	Alpha	Possible Values: P – Percentage of Quote Based V – Volume Based T – Transaction Count Based
Pad	2		
Total	28		

Risk Mitigation Alert Message

OX sends this message to clients when their Risk Mitigation thresholds are breached and Risk Mitigation has been activated.

During trading when the risk mitigation threshold is breached, only one of the sessions that participated in the breach, (last) trade, will get the risk mitigation alert. The other sessions will notice that trading is disabled if they try to send new quotes.

All the quotes for the stock regardless of which session it was sent from will be pulled out.

Risk Mitigation Alert Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'R'
Filler	1	Not Used	

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Risk Mitigation Alert Message	Len	Type	Notes and Values
Message Length	2	Binary	Message Length
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Underlying Symbol	8	Alpha	
Underlying Group	4	Binary	
Pad	0		
Total	20		

Self Trade Prevention Request Message

The Exchange defaults all Market Maker Quotes with STP Type Cancel Old. To change the default STP Type configuration per Underlying Symbol for a given MMID, the Self Trade Prevention Request may be used.

Self Trade Prevention Request Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'P'
Filler	1	Not Used	
Message Length	2	Binary	Message Length
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Underlying Symbol	8	Alpha	
SelfTradePreventionType	1	Alpha/Numeric	D – Disable STP (allow self trade) N – STP Cancel New O (letter O) – STP Cancel Old C – STP Cancel Both
Pad	3		
Total	20		

Self Trade Prevention Ack Message

This message acknowledges successful or unsuccessful processing of a Self Trade Prevention Request. If successfully applied, the requested STP Type will be applied to all quotes entered for that symbol by that MMID, on a go-forward basis. STP configurations are persisted overnight.

Self Trade Prevention Ack Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'p'
Filler	1	Not Used	
Message Length	2	Binary	Message Length
Underlying Group	4	Binary	

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Self Trade Prevention Ack Message	Len	Type	Notes and Values
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.
Underlying Symbol	8	Alpha	
Rejection Code	2	Binary	The rejection reason. See the "Rejection Code Appendix"
SelfTradePreventionType	1	Alpha/Numeric	D – Disable STP (allow self trade) N – STP Cancel New O (letter O) – STP Cancel Old C – STP Cancel Both
Pad	1		
Total	24		

Quote Fill (Execution) Message

This message informs the marker maker there was a fill against their quote. This message contains a sequence number to prevent loss of messages during disconnections.

Clients should record the last sequence number processed from the server. In the event of a disconnect, clients sent the last sequence number processed to the server in the Logon message to have OX replay any missed messages.

The following fields in the Fill message can be used to map back to an original quote.

Quote ID maps to the original Bulk Quote message.

Series Index and Side will map to the actual quote within that Bulk Quote message.

The Execution Id is used to identify an execution in the OX system, unique by Exchange. The Bust or Correct message uses this identifier to map to the execution.

Quote Fill Message	Len	Type	Notes and Values
Message Type	1	Alpha/Numeric	'f'
Filler	1	Not Used	
Message Length	2	Binary	Message length
Sequence Number	4	Binary	OX sequence number
Transaction Time	4	Binary	Time the message was sent in milliseconds since Midnight.
Series Index	4	Binary	The series for this quote
Execution Id	8	Binary	Execution ID, unique per Exchange, per day.
Quote Id	4	Binary	Client-assigned quote ID
Last Contracts	4	Binary	Number of contracts filled
Last Price	4	Binary	Price at which the contracts were filled
Market Maker Id	4	Alpha/Numeric	OCC clearing account mnemonic.

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Quote Fill Message	Len	Type	Notes and Values
Price Scale	1	Alpha/Numeric	"0" – "4"
Liquidity Indicator	1	Alpha/Numeric	A = added R = removed O = opening auction P = BOLD added
Side	1	Alpha/Numeric	"1" = Bid "2" = Ask
Pad	5		
Total	48		

Bust or Correct Message

This message is sent when a trade has been busted or corrected. In all cases the trade desk will have discussed the bust or correction with the MM prior to entry.

The Execution Id can be used to map to the original execution message.

Bust or Correct Message	Len	Type	Notes and Values
Message Type	1	Alpha/numeric	'C'
Filler	1		
Message Length	2	Binary	The length of the message
Sequence Number	4	Binary	ARCA-assigned sequence number
Transaction Time	4	Binary	Time the message was sent in milliseconds since Midnight.
Quote Id	4	Binary	Client-assigned ID of the quote that is being busted or corrected.
Execution Id	8	Binary	Execution Id of the original transaction being busted/corrected, unique per Exchange, per day.
Quantity	4	Binary	Contracts
Price	4	Binary	Corrected price on a correct message
Price Scale	1	Alpha/Numeric	"0" – "4"
Type	1	Numeric	1 = Bust 2 = Correct
Padding	6		Padding
Total	40		

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Appendix: Recovery Example

Successful Reconnect Example:

OX has ten executions to send to the client. A disconnect occurs during communication between the server and client and the client only receives four messages.

When the Client reconnects, it sends the number 4 back to the server as the last sequence number processed. The server starts replaying messages with message 5.

Unsuccessful Reconnect Example

OX has ten executions to send to the client. A disconnect occurs during communications between the server and client and the client only receives four messages.

The Client reconnects to the server and passes a last sequence number of 11. In this situation there is something functionally wrong between the sessions.

The Server will send a Logon Reject with a reject code of "Invalid Sequence number" and a Last Sequence Number Sent of 10. OX will close the connection.

The client has two choices to reconnect successfully:

- Logon with a Last Sequence Number Processed of 10.
- Logon with a Last Sequence Number Processed of negative one (-1). This will turn off the sequence number validation check on the server. The client should contact the ARCA connectivity group to determine what else may need to be done.

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Appendix: Quoting – Best Practices

Quote Takedowns:

Takedown - Series level

1. Cancels quotes in a series
2. The MM is not disabled from trading for the series
3. A single Takedown Ack is generated with series populated
4. The request does not cancel quotes if it is sent from another session

Takedown - GroupID Level

1. Cancels quotes that belong to the requested group
2. The MM is not disabled from trading for the series or for the group
3. A single Takedown Ack is generated with the GroupID
4. The request won't cancel quotes if they are sent from another session even if the GroupID matches

Takedown – Underlying Symbol

1. Takedown is allowed for an underlying symbol if MM is requesting the takedown from a session that is used to send MM quotes for that underlying symbol
    i. If MM quotes for an underlying symbol that is sent from multiple sessions, takedowns are accepted from any one of those sessions
2. Takedowns results in cancellation of all the MM quotes for that underlying symbol and also disables the MM from further trading until such time when re-enable is requested from one of the sessions
3. Takedown acks will be sent in response to Takedown request
    ii. One Ack message is sent for every group in the underlying symbol
    iii. If MM does not have permissions, a reject is sent instead of an Ack
    iv. Only the session that sent the takedown receives the Ack message

Takedown - User Level

1. User Level takedowns will be internally translated into takedown for each stock that the MM has permission. Takedown for each stock is processed exactly as described in the 'Takedown by stock' section above.
    i. For all the stocks quoted from the session that sent the takedown request, the quotes will be cancelled and the stocks will be disabled.
    ii. No message is generated for symbols for which MM does not have permission

Session Disconnects:

1. MM session disconnects trigger auto generation of takedowns in the system that behaves similar to user level takedowns except for the following difference.
    i. MM session disconnects does not result in generation of Ack messages

For additional details and clarifications regarding takedowns and session disconnects, see examples in the section titled "Appendix: Quoting – Message Examples"

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Risk Mitigation Alerts:

1. During trading when RM threshold is breached or quote Arbitrage Check fails, only one of the sessions of the dealer that participated in quoting that symbol for that day will get the RM alert. The other sessions will notice that trading is disabled if they try to send new quotes.
2. All the quotes for the stock regardless of which session it was sent from will be pulled out.
3. RM alert message (R) will be sent for each GroupID.

Risk Mitigation Requests:

1. RM enable can be originated from any session regardless of whether the symbol was quoted from that session before to put the MM back into the market.
2. If the symbol has multiple groups, RM enable acks will be generated for each group.

Price Protection Filters:

1. Two types of market maker quote price protection filters are available during pre-open, halt and core trading
    i. NBBO Check for all Bids and Offers (specified % through contra NBBO market results in reject)
    ii. Arbitrage Check for Call Bids vs. Underlying Last Sale price and Put Bids vs. Strike Price
        1. Any call bid =/> underlying last sale will be rejected
            a. If Underlying has not yet opened, the prior day's adjusted close price will be used
            b. If Underlying is halted, the last sale price immediately prior to the halt will be used
        2. Any put bid =/> strike price will be rejected

2. Whenever NBBO is present, the NBBO check is primary
    i. If NBBO is not available, the arbitrage check will be primary

3. Bids or Offers that breach the NBBO check will be rejected and the preceding Bid or Offer in the affected series will be cancelled

4. Call or Put Bids that breach the Arbitrage check will be rejected and all resting quotes for the underlying will be pulled.
    i. An RM alert message (R) will be sent for the affected underlying
    ii. A re-enable message must be sent prior to resumption of quoting
    iii. Symbol level RM events due to the arbitrage breach will not accumulate toward a GRMP event.

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Appendix: Quoting – Message Examples

To illustrate the various takedown behaviors, consider the following setup for various scenarios.

- Market maker ID is M01.
- M01 is connecting using the following sessions: SESS1, SESS2.
- M01 is permission for the following symbols: AAP (1 group), GLD (5 groups).
- AAP has following series: Nov 80 Calls, Nov 80 Puts
- GLD has following series (1 call and 1 put for each group respectively):
    - Nov 10 Calls, Nov 12.5 calls, Nov 15 calls, Nov 17.5 calls, Nov 20 calls
    - Nov 10 puts, Nov 12.5 puts, Nov 15 puts, Nov 17.5 puts, Nov 20 puts

Takedown - Series level

Scenario 1: MM processes takedown quotes from the same session

- M01 sends the following quote from SESS1.
    - 5-5.30 10x10 for AAP Nov 80 calls
- M01 sends series takedown from SESS1.

Expected result:

- Quote in the series is cancelled
- AAP is not disabled
- SESS1 gets takedown ack

Scenario 2: MM cannot takedown quotes from another session

- M01 sends the following quote from SESS1.
    - 5-5.30 10x10 for AAP Nov 80 calls
- M01 sends series takedown from SESS2.

Expected result:

- Quote takedown ack sent to SESS2
- Quotes are not removed from SESS1

Takedown - Group level

Scenario 1: MM cannot takedown quotes from another session but process takedowns from the same session.

- M01 sends the following quote from SESS1.
    - 5-5.30 10x10 for GLD Nov 10 calls
    - 5-5.30 10x10 for GLD Nov 15 calls
    - 5-5.30 10x10 for GLD Nov 20 calls
- M01 sends the following quote from SESS2.
    - 5-5.30 10x10 for GLD Nov 10 Puts

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  - 5-5.30 10x10 for GLD Nov 15 Puts
  - 5-5.30 10x10 for GLD Nov 20 Puts
- M01 send group takedown for 1 group (GLD Nov 10 calls/puts) from SESS2.

Expected result:

- Will only Takedown GLD Nov 10 Puts .
- Other series that belongs to a different group or is quoted by a different session will not be taken down.
- Underlying is not disabled. Single ack for GroupID will be generated.

Takedown – Underlying Symbol Level

Scenario 1: Underlying Symbol is exclusively quoted by session requesting the takedown.

- M01 sends the following quotes from SESS1.
  - 5-5.30 10x10 for GLD Nov 10 calls
  - 5-5.30 10x10 for GLD Nov 15 calls
  - 5-5.30 10x10 for GLD Nov 20 calls
  - 5-5.30 10x10 for GLD Nov 10 Puts
  - 5-5.30 10x10 for GLD Nov 15 Puts
  - 5-5.30 10x10 for GLD Nov 20 Puts
- M01 send takedown for GLD from SESS1.

Expected result:

- All the 6 quotes are cancelled.
- GLD is disabled
- 5 Acks, 1 per GroupID is sent to SESS1.

Scenario 2: Underlying Symbol is quoted by multiple sessions including the session requesting the takedown.

- M01 sends the following quote from SESS1.
  - 5-5.30 10x10 for GLD Nov 10 calls
  - 5-5.30 10x10 for GLD Nov 15 calls
  - 5-5.30 10x10 for GLD Nov 20 calls
- M01 sends the following quote from SESS2.
  - 5-5.30 10x10 for GLD Nov 10 Puts
  - 5-5.30 10x10 for GLD Nov 15 Puts
  - 5-5.30 10x10 for GLD Nov 20 Puts
- M01 send takedown for GLD from SESS1.

Expected result:

- All the 6 quotes are cancelled.
- GLD is disabled
- 5 Acks, 1 per GroupID, is sent to SESS1.

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Scenario 3: Underlying Symbol is quoted by multiple sessions but does not include the session requesting the takedown.

- M01 sends the following quotes from SESS1.
  - 5-5.30 10x10 for GLD Nov 10 calls
  - 5-5.30 10x10 for GLD Nov 15 calls
  - 5-5.30 10x10 for GLD Nov 20 calls
  - 5-5.30 10x10 for GLD Nov 10 Puts
  - 5-5.30 10x10 for GLD Nov 15 Puts
  - 5-5.30 10x10 for GLD Nov 20 Puts
- M01 send takedown for GLD from SESS2.

Expected result:

- No quotes cancelled.
- GLD is not disabled
- 5 Acks, 1 per GroupID is sent to SESS2.

Scenario 4: Underlying Symbol is not quoted but MM has permission to quote.

- M01 logins into SESS1.
- M01 send takedown for GLD from SESS1.

Expected result:

- GLD is not disabled
- 5 Acks, 1 per GroupID, is sent to SESS1.

Scenario 5: Underlying Symbol is not quoted but MM does not have permission to quote.

- M01 logins into SESS1.
- M01 send takedown for ORCL (not permissioned symbol) from SESS1.

Expected result:

- ORCL is not disabled
- MM gets Takedown reject

Takedown - User Level/Session Disconnects

Scenario 1: User takedown disables all stocks from the current session.

- M01 sends the following quotes from SESS1.
  - 5-5.30 10x10 for GLD Nov 10 calls
  - 5-5.30 10x10 for GLD Nov 15 calls
  - 5-5.30 10x10 for GLD Nov 20 calls
  - 5-5.30 10x10 for AAP Nov 80 calls
  - 5-5.30 10x10 for AAP Nov 80 Puts

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- M01 sends the following quotes from SESS2.
    - 5-5.30 10x10 for GLD Nov 10 Puts
    - 5-5.30 10x10 for GLD Nov 15 Puts
    - 5-5.30 10x10 for GLD Nov 20 Puts
- SESS1 sends a takedown by user.

Expected result:

- GLD, AAP are disabled
- 6 takedown acks are sent to SESS1 (5 from GLD, 1 from AAP)
- SESS2 does not get any Ack

Scenario 2: User takedown generates acks for not disabled stocks as well.

- M01 sends the following quotes from SESS1.
    - 5-5.30 10x10 for GLD Nov 10 calls
    - 5-5.30 10x10 for GLD Nov 15 calls
    - 5-5.30 10x10 for GLD Nov 20 calls
    - 5-5.30 10x10 for AAP Nov 80 calls
    - 5-5.30 10x10 for AAP Nov 80 Puts
- M01 sends the following quotes from SESS2.
    - 5-5.30 10x10 for GLD Nov 10 Puts
    - 5-5.30 10x10 for GLD Nov 15 Puts
    - 5-5.30 10x10 for GLD Nov 20 Puts
- SESS2 sends a takedown by user.

Expected result:

- GLD is disabled, AAP is still enabled
- 6 takedown acks are sent to SESS2 (5 from GLD, 1 from AAP)
- SESS1 does not get any Takedown Ack

Scenario 3: Underlying Symbol is quoted by multiple sessions but does not include the session requesting the takedown.

- M01 sends the following quotes from SESS1.
    - 5-5.30 10x10 for GLD Nov 10 calls
    - 5-5.30 10x10 for GLD Nov 15 calls
    - 5-5.30 10x10 for GLD Nov 20 calls
    - 5-5.30 10x10 for GLD Nov 10 Puts
    - 5-5.30 10x10 for GLD Nov 15 Puts
    - 5-5.30 10x10 for GLD Nov 20 Puts
- M01 send takedown for GLD from SESS2.

Expected result:

- No quotes cancelled.
- GLD is not disabled

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Appendix: Global RM_Automated Re-enable Prevent

Global Risk Reject Notes

1) NYSE Arca Options will be introducing Global Risk Mitigation (Global RM) functionality for participants. Global RM will count number of symbol-level risk breaches over a 100 millisecond time frame.
2) Exchange will establish a min/max threshold range, clients can select tolerances within that range
3) Not dependent on the type of symbol risk mitigation selected by client
   a) Transaction, Volume, or % of quote/order
4) Aggregated at OTP/ATP ID for orders
5) Multiple triggers can occur within a single symbol or across multiple symbols
6) Global RM event will require an email to Trade Desk (no API re-enable allowed)
7) Once globally re-enabled, clients will be able to re-enable on a symbol level via the API
   a) For an Order Sending Firm, Global RM will apply to any issue(s) for which the OSF has selected symbol level RM
      i) New PNP orders will be rejected with "**Firm GRPM breached**" when firm is globally breached, new risk mitigation request will be also rejected.

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Appendix: Risk Mitigation Explanation

Risk mitigation

OX has the ability to protect firms actively quoting from excessive executions due to unusually rapid trading activity. OX can immediately pull a market maker's quotes from the market after certain user-defined thresholds of trade activity are reached.

Three risk limit types are available.

1) Transaction
2) Volume
3) Percentage of quote

Threshold checking occurs during auctions as well as core trading sessions. When risk mitigation is invoked, the firm receives a Risk Mitigation Alert message indicating that the alarm was triggered and they are out of all quotes in the indicated underlying (e.g. IBM). In order to enter the market again, the MM must re-submit a Risk Mitigation Request message for each underlying in which an alarm was triggered.

Once the threshold for an underlying has been reached, all quotes for that underlying will be pulled. It is not affected by orders submitted by the MM. It does not count MM Orders towards a MM's risk limitation threshold. MM firms will have the ability to change the assigned threshold values anytime intra-day.

Transaction based risk mitigation

Transaction based risk mitigation is accomplished by tracking the number of trades executed in 100 milliseconds for all series associated with one underlying assigned to a market maker.

Volume based risk mitigation

Volume based Quote risk mitigation is accomplished by tracking the number of contracts executed in 100 milliseconds for a certain underlying by an OTP/ATP market making firm.

Percentage of Quote risk mitigation

Percentage of Quote risk mitigation is accomplished by tracking the number of contracts executed in 100 milliseconds for a certain underlying by an OTP/ATP market making firm against total quote size on a percentage basis.

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Appendix: Dedicated Cancel Session

1) Only accept takedowns by MMID and symbol.
2) Takedown by MMID will remove all quotes from all sessions belonging to the MarketMaker.
3) Takedown by MMID will disable the MarketMaker from all symbols they have permission.
4) Takedown by symbol will remove all quotes(for the symbol) that belong to the MarketMaker that sent the takedown request.
5) Takedown by GroupID and series will be rejected.
6) Takedown requests will be acknowledged via the Dedicated Cancel Session.
7) Quotes from other sessions will not be affected if Dedicated Cancel Session gets disconnected.

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Appendix: Rejection Codes

Reject number	Name	Description
0	Success	No Reject
1	System Unavailable	The Trading System is unavailable.
3	Invalid Sequence Number	The Last Sequence Number in a Logon message is larger than MM Direct expected. This identifies recoverable responses such as execution reports.
4	Invalid Series Index	The series index number in the message is greater than MM Direct expected.
5	Series Non-Active	Same as name.
6	Invalid Value (See description)	Invalid value error for one of the following reasons: • Risk Mitigation is below the minimum allowable setting • Mass Quote ID is 0 • Series Index is less than 0
7	Client Session Already Active	The user has attempted to login when an existing client session is still active. Only one client session is supported per user.
8	Client Session Disabled	The user has attempted to reconnect to a disabled client session.
9	Invalid MMID	The market maker ID is invalid, or rejection of a Quote, Series Takedown or Group ID takedown on a Dedicated Cancel Session.
10	Invalid Series	The Series request is not valid or configured in OX.
11	Underlying Mismatch	Packed message has unmatched underlying series.
12	Invalid Price	The price is invalid.
13	Invalid Size	The volume is less than zero.
14	Unknown Underlying	The underlying symbol does not match any known underlying.
15	Invalid Market Maker for Underlying	The market maker does not make markets for the underlying for this quote.
16	Invalid Market Maker	The market maker specified is not defined as a market maker.
17	Logon Read Failed	An error occurred reading the Logon message. Since the session name could not be determined, the last sequence number and last series index values in the rejection message are set to -1 (unknown).
18	Not Logon Message	The first message received from a client was not a Logon message. Since the session name could not be determined, the last sequence number and last series

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Reject number	Name	Description
		index values in the rejection message are set to -1 (unknown).
19	User Name Not Found	The user name from the Logon message is invalid.
20	Risk Mitigation Limit Exceeded	The quote was rejected because it caused the market maker to exceed his risk mitigation limit or because he has already exceeded this limit.
21	Invalid quote count	The value in the Number of Quote Messages field in a Bulk Quote message is invalid (0 or negative).
22	Invalid underlying symbol	The message contained an invalid or unknown underlying symbol.
23	Invalid side	The quote contained an invalid value for Side.
24	Invalid price increment	The quote price is invalid. Prices are invalid for options that use nickel/dime price increments if the price is in pennies or if the price is greater than $3.00 but is not a dime increment.
25	Series is halted	Same as name.
26	MM is not active	Market maker is not set as active for underlying the series belongs to.
27	Duplicate quote id	Two consecutive mass quotes for the same underlying cannot have the same QuoteID.
28	Internal error	There are some internal conditions that prevent the processing of the quote. No details are provided because the reason for the problem maybe unknown.
29	Market is closed	Same as name.
30	The Risk Mitigation is above the maximum allowable	The Risk Mitigation is above the maximum allowable
31	Disconnect Takedown	Quote systems not connected.
32	Series Closed	A series is closed or an ALO Quote was sent prior to Open
33	Underlying Group Mismatch	The underlying group for a quote does not match the underlying group for this bulk quote message. All quotes in a bulk quote message must be for series belonging to one underlying group.
34	Market Not Open	Same as name.
36	Unsupported Risk Mitigation Type	Risk Mitigation Type is either invalid, OR Risk Mitigation Type is valid (Set to Percent, Volume, Transaction), but is not supported at the moment.
37	Global Breach	Market Maker is Globally Breached
39	Too-Executable	The Quote entered is too executable per the price reasonability check.

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Reject number	Name	Description
40	Market Maker Light Only Quote Locking/Crossing PNP-B Orders	Indicates that a Market Maker Light Only Quote has been rejected to avoid taking liquidity, because it is locking/crossing PNP-B orders on arrival.
41	Market Maker Quote Locking/Crossing Away Market	Indicates that a Market Maker Quote (either regular quote or Market Maker Light Only Quote) has been rejected on arrival or cancelled after partially executing, because it is locking/crossing an away market quote. Rejected on arrival – Bulk Quote Rejection message will be sent. Cancelled after partial execution – unsolicited Quote Takedown Ack message will be sent.
42	Feature Not Available	Reject reason for features not currently supported.
43	Self Trade Prevention	Indicates that a Quote has been canceled due to Self Trade Prevention.
44	Invalid Value	Indicates that a Self Trade Prevention Request has been rejected due to invalid value.
45	Too Aggressive for Re-pricing	For incoming Re-pricing Quote/Re-pricing ALO Quote.
46	Invalid Display Price	For incoming Re-pricing Quote/Re-pricing ALO Quote that would display at $0.00.

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Revision History

Date	Revision	Synopsis of Change
08-01-2005	0.1	Original document
08-31-2005	0.2	suggested edits
09-06-2005	0.3	Suggested Edits
10-18-2005	0.4	Added Acknowledgments
10-25-2005	0.5	Changes from last discussion
10-28-2005	0.6	Updates to Logon
10-31-2005	0.9	ArcaBook to ArcaQuote
10-31-2005	1.0	Edits for consistency, fix to Bust/Correct
12-07-2005	1.1	Changes to quote messages and acknowledgement process.
12-29-2005	1.2	Change based on MM feed back. Added message lengths and Risk Mitigation Request Ack. Removed the Quote ID for one-sided quote. Modified the Quote ID to 2 byte integer
01-04-2006	1.3	Minor copy edits.
01-06-2006	1.4	Final copy edits and new Reject All Bulk Cancel message. Changed ArcaQuote to ArcaBook for Options. Fixed Side values.
01-20-2006	1.5	Updated rejection codes and Side field. Removed publishing state for future use. Updated references to OTP holders (PCX). Added OCC Root and OPRA Symbol fields in Series Update message.
01-31-2006	1.6	Updates to Transaction Time field. New rejection codes.
02-07-2006	1.7	Series identification clarifications. Future use for explicit symbology. Specification name change. Corrected ArcaQuote reference in diagram. New rejection codes.
02-23-2006	1.8	New rejection codes. Changes to Series Update, Quote TakeDown, Risk Mitigation Ack and Bulk Quote Ack messages. Clarification on binary fields. Added version to Logon message.
03-01-2006	1.9	New rejection codes.
03-22-2006	1.10	Updated Quote Takedown Request Message text. Added text to Quote Takedown Ack Message. Added new field, “Action” to Risk Mitigation Request Message and Risk Mitigation Ack Message. Added text to second bullet under Risk Mitigation Request Message. Added Reject Code “10” to Rejection Codes appendix. Revised Archipelago API Certification section.
04-27-2006	1.11	All messages with an OCC MMID have been changed from 3 to 4 characters. This shifts the alignment of fields following the OCC MMID in most messages. All messages are the same size but the length of the Risk Mitigation Ack message increased by 4 bytes.
05-01-2006	1.11	Changed Put/Call values to 0=Put, 1=Call; added new version 3 = MMDirect version 1.11

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Date	Revision	Synopsis of Change
05-08-2006	1.11	Updated Overview of Market Maker Interfaces drawing to reflect NYSE Arca.
05-09-2006	1.11	Revised Notes and Values for Volume field in Bulk Quote Message to reflect new max limit of 32,767
05-09-2006	1.12	Clarified definitions in Notes & Values in Login message for "user name" and in all messages for "market maker id"; also Logon Reject message added Pad=2; size to 60.
05-15-2006	1.12	Added quotation marks to number values for Side field in Bulk Quote, Bulk Quote Ack and Quote Fill messages.
06-13-2006	1.13	Revised Strike Price to 2 decimal places
09-19-2006	1.13	Added reject codes 25-30
10-30-2006	1.13	Added reject code 31
12-11-2006	1.13b	Clarified takedown message format. Added reject code 32
10-22-2008	3.0	Order of field structure change for message 'f' and 'C'; increase size of ExecID from 4 bytes binary to 8
11-17-2009	3.1	Added OSI Rollout Update to Series Update Message
03-05-2010	3.2	Corporate Action Field not currently used on Series Update Message
05-10-2011	3.3	Added information regarding GroupID changes
07-06-2011	3.4	Updated series update message, added reject code 33 and updated reject code 11
08-24-2011	3.5	Updated Quote Takedown, Quote Takedown Ack, Risk Mitigation Request, Risk Mitigation Ack, and Risk Mitigation Alert; to show changes for Underlying GroupID
08-29-2011	3.6	Changed Underlying Group message type/length – Updated Quote Takedown, Quote Takedown Ack, Risk Mitigation Request, Risk Mitigation Ack, and Risk Mitigation Alert, Series Update Message; to show changes for Underlying GroupID
10-06-2011	3.7	Added Appendixes – Best Practices and Messaging Examples
12-13-2011	3.8	Removed Reject Reason "2" – Crossed NBBO
03-05-2012	3.9	Updated Bulk Quote message, Updated Risk Mitigation Request (Renamed "Trade" field to "Risk Limit" & Changed "Pad" field to "Risk Mitigation Type"), Updated Risk Mitigation Ack (Renamed "Trade" to "Risk Limit", Added field "Risk Mitigation Type", changed "Pad" size from 3 to 2), and updated Quote Takedown Ack (Added "Side" field to message and updated "Pad" size from 2 to 1)
04-04-2012	4.0	Updated "Quote Fill" message, indicated Execution ID is unique per gateway NOT session ID.
04-25-2012	4.1	Added "Risk Mitigation Explanation" Section and Added New Reject Reason Code 36.

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Date	Revision	Synopsis of Change
05-31-2012	4.1.1	Updated document to address formatting issues in the 4.1 version.
07-12-2012	4.2	Updated Risk Mitigation message to include new Risk Limit definitions in the "Risk Limit" field.
08-30-2012	4.2.1	Removed References to "Global Threshold"
09-07-2012	4.2.2	Updated Transaction, Volume, and Percentage based Risk Mitigation thresholds and timers.
09-11-2012	4.2.3	Updated Reject Codes '6' and '30'
03-11-2013	4.2.4	Updated Quote Takedown Ack, Risk Mitigation Alerts, & Takedown – Series Level Scenario 2
07-12-2013	4.2.5	Added new logic for requesting/processing Series ID
08-30-2013	4.2.6	Added Reject Code '38'
09-11-2013	4.2.7	Added Appendix explaining "Global RM_Automated Re-enable prevent"
09-11-2013	4.2.8	Added Reject Code '37'
02-18-2014	4.2.9	Added Appendix for 'FastLane'
04-22-2014	4.3	Removed reject code '38'
02-09-2015	4.4	Added Reject Code '39' and Added "Price Protection Filters" section in Appendix: Quoting – Best Practices.
05-01-2015	4.4.1	Clarification regarding Risk Mitigation alert in Appendix: Quoting – Best Practices.
08-25-2016	4.5	Updated values for series ID index numbers as described in Section 3: Session Management Messages – "Series Request Message": - First day of month Series ID range updated to 10,000,001 – 20,000,000 (previously 1,000,001 – 2,000,000) - Series ID range daily increment updated to 10,000,000 (previously 1,000,000)
01-5-2017	5.0	Added support for Post or Light Market Maker Quotes** (**reserved for future use; available for Certification Q1 2017). Added sub section, "Quoting an Underlying Group ID by Gateway Session" to Appendix: Quoting – Best Practices. Updated section, "Takedown – User Level/Session Disconnects." Added new codes 40 – 42 to Appendix: Rejection Codes.
01-31-2017	5.1	Renamed "Post or Light Market Maker Quotes" to "Market Maker Light Only Quote" (available for Certification Q1 2017).

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Date	Revision	Synopsis of Change
04-11-2017	5.2	Removed section “External Locks or Crosses” from Overview, Market Maker Quoting. Updated section, “Takedown – User Level/Session Disconnects.”
08-16-2017	5.3	Updated description of ‘Execution Id’ field in Quote Fill (Execution) Message and Bust/Correct Message, to indicate that the identifier is now unique per Exchange, per day. Added value “P” to ‘Liquidity Indicator’ field in Quote Fill (Execution) Message in support of BOLD execution adding liquidity. Rebranding for NYSE American Options (formerly NYSE Amex Options).
10-09-2017	5.4	Added sub-section “Self Trade Prevention” under “OX Overview.” Added new message types “Self Trade Prevention Request” and “Self Trade Prevention Ack.”
11-14-2017	5.5	Added new codes 43 and 44 to Appendix: Rejection Codes.
05-02-2018	5.6	Updated pre-open period time for NYSE Arca Options and NYSE American Options in section “Hours of Operation.”
07-13-2018	5.7	Added code 34 to Appendix: Rejection Codes. In Appendix: Quoting - Best Practices, removed restriction that a single session must be used to quote a given Underlying Group ID; multiple sessions may now be used.
10-01-2018	6.0	Added support for Re-pricing Quote (NYSE Arca & American Options) and Add Liquidity Only (ALO) Re-pricing Quote (NYSE Arca Options). Added new message type “Display Price Update Acknowledgement - for Re-pricing Quotes.”
07-24-2019	6.1	Clarified the meaning of reject code ‘6’ - Invalid Value, see description text for details.
09-25-2019	7.0	Added Bulk Quote Message with Sending Time (msg type = ‘Q’) and Quote Takedown Message with Sending Time (msg type = ‘U’) for supporting new CAT rules; both messages also include additional padding for future enhancements.

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Date	Revision	Synopsis of Change
01-24-2020	7.1	Updated Bulk Quote Message and Quote Takedown Message with Sending Time to support the time in nanoseconds since Epoch.
04-14-2022	7.2	Removal of legacy Bulk Quote (Msg Type = M) and Takedown (Msg Type = T) messages as they were replaced with CAT compliant versions.

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